

## **New Approaches to Reduce the Risk of Neosporosis Abortion in Cows**

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Neosporosis is a common disease of cattle that is caused by the protozoan (one-celled) parasite, *Neospora caninum*. Infection of pregnant cows causes abortion. The first recognized outbreak of neosporosis abortion occurred in a New Mexico dairy and was reported in 1989. Ten years later, evidence of neosporosis has been found on every continent but Antarctica. *Neospora* infection is the single most common cause of abortion in dairy cattle in New Zealand, Great Britain, the Netherlands, and California. In the U.S. neosporosis has been diagnosed throughout the country, including Colorado. Beef cows can also contract this disease, but it is more common in intensively managed dairy cattle operations.

The list of states and countries that have identified neosporosis is growing at a rapid clip. This trend reflects increased awareness of the disease, improvements in veterinary diagnostics, and a real rise in incidence. Most reports of neosporosis outbreaks have occurred in cows that are intensively managed; thus, the incidence increases as larger farms with intensive feeding practices become more common.

Recently, dogs were discovered to be carriers of *Neospora*, capable of shedding environmentally resistant forms of the parasite, called oocysts, in their feces. Other animals become infected when they consume the *Neospora* oocysts. In turn, dogs obtain the parasite when they consume the carcass of an infected animal. In parasitological parlance, the dog is the "definitive host" of *Neospora*, and cattle are "intermediate hosts". Although previously suspected, cats do not transmit this disease. With this new knowledge, management practices can be devised to reduce the risk of transmission from dogs to cattle, even if dogs remain on the premises, as most dairy producers will prefer.

Management practices suggested in this article are designed to reduce the risk of disease transmission. The focus is on management of the interaction between dogs and cattle and breaking the cycle of disease transmission. No control programs on the farm can completely eliminate the risk of neosporosis because it is possible that purchased feedstuffs could be contaminated before deliver

Prevent fecal contamination of feed. Evidence indicates that abortion outbreaks may occur from contamination of the mixed ration. If an infected dog defecates on a silage pile or other commodity that is then mixed into the total-mixed-ration, a large number of pregnant cows could become infected. As the average size of dairies has increased and, thus the sheer volume of feed consumed, so has the tendency to store feeds outdoors or in open-faced sheds, rather than in silos, bins, and haylofts. Dogs must be trained not to defecate in or around feedstuffs or feedstuffs may be enclosed within dog-proof fences. Other diseases spread via contaminated feed include salmonellosis, leptospirosis, listeriosis, and botulism.

Keep dogs from acquiring infection with Neospora. Although we don't know if dogs might become infected by hunting small animals, there is strong evidence that dogs do become infected by consuming cattle carcasses. Dogs should not be allowed to eat aborted fetuses or calves that die (from any cause). Consumption of infected bovine placentas does not appear to be an efficient method of infecting dogs.

Dog populations should be managed. There is a strong statistical association between the number of dogs on dairies and the likelihood that cattle will be infected with Neospora. It is unwise to allow bitches to breed and raise litters of puppies around cows or replacement heifers. Under most circumstances, bitches on dairies should be spayed. Stray dogs should be controlled.

Pens and feedbunks should be cleaned routinely. Keeping dogs out of pastures is not practical. The much lower incidence of neosporosis in beef cattle suggests that contamination of pasture is a less important source of infection than is contamination of mixed feeds. Similarly, direct contamination of cattle pens and feedbunks by dogs is probably a relatively minor concern. This is because Neospora oocysts are not immediately infectious when they are passed in the feces, but must develop for a period outside of the body. Therefore, routine cleaning of pens and feedbunks may be sufficient to reduce the risk of neosporosis transmission from dogs that may defecate in these areas.

Limit contamination by wild canids. Coyotes and other wild canids have not been adequately tested to determine if they are also definitive hosts of Neospora, but it seems reasonable to suspect that they are.

These management practices are logical suggestions based on current knowledge about the Neospora. Herds that already have neosporosis may experience sporadic neosporosis abortions for several years, even if transmission from dogs is completely eliminated. This is because infections in cattle may last for life, and infections may be transmitted from chronically-infected cows to their fetuses. Most of these calves born will appear perfectly normal. Infected cattle can be identified by a blood test that detects antibodies to Neospora. Some scientists have recommended culling infected cows, or using infection status as one criterion when making culling decisions. However, if transmission from dogs can be prevented, then the incidence of abortion in the herd should gradually drop to "normal" over the course of several years, without any testing or special culling.